

## **Editorial**

### **Health Risks of Electromagnetic Field**

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Many members of the public are concerned about the health effects of the electromagnetic field (EMF) which is emitted by many equipments surrounding us at work and at home which is a feature of the age of communication.

Natural and many man-made sources such as high voltage power lines, radar, radio, TV, computer, microwave oven, satellite dishes, mobile telephones and their base stations generate electromagnetic energy in the form of electromagnetic waves. These waves consist of oscillating electric and magnetic fields which interact differently with biological systems such as cells of plants, animals and human beings. The interaction between cells and these waves depends on the wavelength, frequency and the amount of energy in the photons.

X-rays and gamma rays emit extremely high frequency EMF which have enough photon energy to produce ionization (create positive and negative electrically charged atoms or parts of molecules) by breaking the atomic bonds that hold molecules in cells together, which is associated with a possible cancer risk.

Non-ionizing radiation (NIR) is a general term for that part of the electromagnetic spectrum, which has photon energies too weak to break atomic bonds. They include ultraviolet (UV) radiation, visible light, infrared radiation, radio frequency and microwave field, static electricity and magnetic fields. Even high intensity Radio Frequency (RF) fields emitted by mobile telephone base stations, or high intensity electromagnetic fields generated by high voltage power lines cannot cause ionization in a biological system such as cells of plants, animals and human beings. Having said that, one study showed that exposure to low-levels of RF fields, too low to produce heating, has been reported to alter the electrical activity of the brain in cats and rabbits by changing calcium ion mobility. This effect has also been reported in isolated tissues and cells.

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Research result in this field is inconclusive, yet the public is concerned whether the electromagnetic field emission contributes to the increasing cancer incidence, hormonal aberration, reduced fertility, memory loss and behavioral disturbance or not.

In May 1996, in response to growing public health concerns, the World Health Organization (WHO) launched an international project to assess health and environmental effects of exposure to electric and magnetic field known as the International EMF project.

The International EMF will be able to highlight the health risks of exposure to static and time varying electric and magnetic fields in the frequency range 0-300 GHZ. It is expected that the project will facilitate the development of universally acceptable standards of limits of human exposure to EMF, standards on the measurement and compliance of EMF emissions for various devices, and possible risks to workers from EMF exposure.

Current scientific evidence indicates that exposure to RF fields is unlikely include or promote cancers. Cancer studies using animals have not provided convincing evidence for an effect on tumor incidence. A recent study found that RF fields, similar to those used in mobile telecommunications, increased the incidence of cancer among genetically engineered mice that were exposed near (0.65 m) and RF transmitting antenna. Further studies will be carried out to determine the relevance of these results to cancer in human beings.

Many epidemiological studies have addressed possible links between exposure to RF fields and increasing incidence of cancer. To date these studies do not provide enough information to allow a proper evaluation of human cancer risk from RF exposure because the results of these are inconsistent.

Mobile telephones, as well as many other electronic devices in common use, can cause electromagnetic interference in other electrical equipment. Therefore, caution should be exercised when using mobile telephones around sensitive electro-medical equipment used in hospital intensive care, coronary care, recovery units and theater suit. Mobile telephones can in rare instances also cause interference in certain other medical devices, such as cardiac pacemakers and hearing aids. Individuals using such devices should contact their doctors to determine the susceptibility of their products to these effects.

Since mobile telephones are quite common in Bahrain it would be advisable to restrict their use in the hospital and to advise the visitors to switch off their mobiles during the visiting hours. It is certain that mobile can interfere with highly sensitive equipments in the hospital. Therefore, physicians and other staff using their own mobiles in the hospital should be alerted to the possible malfunction of sensitive equipments if mobiles used near them.

The health effect of EMF cannot be certain from previous research but hopefully the question will be resolved by the international EMF project sponsored by the WHO for five years. According to WHOM it is interesting to know that Bahrain is one of 43 countries interested in this project. Based on Swedish research a new regulation specifying the safe limit for human residence near high power lines has been implemented only in Sweden not anywhere else. For personal protection it is advisable to use the screen shield for the computer, protection shield for the mobiles and hand free speaker and microphone in the car.

## **REFERENCE**

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2. World Health Organization. Report of the Scientific Review under the auspices of International EMF Project. Munich: Germany, WHO: 1996